

What is claimed is:

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

1. An optical fiber cable, comprising:

an optical fiber ribbon stack comprising a plurality of optical fibers held together in a planar array; and

at least one cushion member disposed on an outer side surface of the optical fiber ribbon stack.

2. The optical fiber cable as claimed in claim 1, further comprising a buffer tube surrounding the cushion member and the optical fiber ribbon stack.

3. The optical fiber cable as claimed in claim 2, further comprising a plurality of cushion members disposed on outer side surfaces of the optical fiber ribbon stack.

4. The optical fiber cable as claimed in claim 3, wherein the cushion members are disposed over corner edges of the ribbon stack.

5. The optical fiber cable as claimed in claim 3, wherein the cushion members are centered on the outer side surfaces of the ribbon stack.

6. The optical fiber cable as claimed in claim 1, wherein the cushion member has an elasticity stiffness which varies across the thickness of the cushion members.

7. The optical fiber cable as claimed in claim 1, wherein the cushion members are disposed along edges of the optical fiber ribbon stack.

8. The optical fiber cable as claimed in claim 1, wherein the optical fibers of the optical fiber ribbon stack are held together by a matrix material, and an outer surface of the cushion member has a contact hardness and a Young's modulus which are approximately the same as a contact hardness and a Young's modulus of the matrix material.

9. The optical fiber cable as claimed in claim 1, wherein the cushion member has a graded contact hardness or Young's modulus which changes from a side of the cushion member which contacts the optical fiber ribbon stack to a side of the cushion member which faces away from the optical fiber ribbon stack.

10. The optical fiber cable as claimed in claim 2, wherein the cushion member has a graded Young's modulus or contact hardness which changes from the Young's modulus or contact hardness of the optical fiber ribbon stack towards the Young's modulus and contact hardness of the buffer tube.

11. The optical fiber cable as claimed in claim 2, wherein a contact hardness of the cushion member on a side of the cushion member which contacts the optical fiber ribbon stack is a softer than a contact hardness of the cushion member on a side of the cushion member which faces the buffer tube.

12. The optical fiber cable as claimed in claim 1, wherein the cushion member is centered on the side surfaces of the optical fiber ribbon stack.

13. The optical fiber cable as claimed in claim 1, wherein the cushion member is twisted together with the optical fiber ribbon stack.

14. The optical fiber cable as claimed in claim 1, wherein a cross-sectional shape of the cushion member is a hollow tube, a rectangle, a trapezoid, or a circle.

15. An optical fiber cable, comprising:
an optical fiber ribbon stack comprising a plurality of optical fibers held together in a planar array;
at least one cushion member disposed on an outer side surface of the optical fiber ribbon stack;

an elastic membrane surrounding the optical fiber stack and the cushion member; and

a filler material provided in the space between the optical fiber ribbon stack and the elastic membrane.

16. The optical fiber cable as claimed in claim 15, further comprising a buffer tube surrounding the elastic member, wherein the filler material is further provided between the buffer tube and the optical fiber ribbon stack.

17. The optical fiber cable as claimed in claim 15, wherein the elastic membrane imposes radial compression on the cushion member, and the optical fiber ribbon stack so that the cushion member is slightly compressed against the optical fiber ribbon stack.

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18. The optical fiber cable as claimed in claim 17, wherein the elastic membrane is formed of a flexible elastomer material.

19. The optical fiber cable as claimed in claim 15, wherein filler material
10 comprises a gel or foam containing a plurality of gaseous bubbles.

20. The optical fiber cable as claimed in claim 15, wherein the filler material comprises be a gel with suspended particles.

15 21. The optical fiber cable as claimed in claim 14, wherein the cushion
member has an elasticity stiffness which varies across the thickness of the cushion
member.

22. The optical fiber cable as claimed in claim 15, wherein the cushion member is disposed over edges of the optical fiber ribbon stack.

23. The optical fiber cable as claimed in claim 15, wherein an outer surface of the cushion member has a contact hardness and a Young's modulus which are approximately the same as the contact hard hardness and Young's modulus of a

matrix material which holds the optical fibers of the optical fiber ribbon stack together in the planar array.

24. The optical fiber cable as claimed in claim 15, wherein the cushion member has a graded contact hardness or Young's modulus which changes from sides of the cushion members which contact the ribbon stack towards sides of the cushion members which face away from the ribbon stack.

25. The optical fiber cable as claimed in claim 16, wherein the cushion member has a graded Young's modulus or contact hardness which changes from the Young's modulus or contact hardness of the ribbon stack towards the Young's modulus and contact hardness of the buffer tube.

26. The optical fiber cable as claimed in claim 15, wherein the cushion member is centered on the side surfaces of the ribbon stack.

27. The optical fiber cable as claimed in claim 15, wherein the cushion member is twisted together with the ribbon stack.

28. The optical fiber cable as claimed in claim 15, wherein a cross-sectional shape of the cushion member is a hollow tube, a rectangle, a trapezoid, or a circle.

29. The optical fiber cable as claimed in claim 16, further comprising a plurality of cushion members disposed on outer side surfaces of the optical fiber ribbon stack.

5 30. The optical fiber cable as claimed in claim 28, wherein the cushion members are disposed over corner edges of the ribbon stack.

31. The optical fiber cable as claimed in claim 28, wherein the cushion members are centered on the outer side surfaces of the ribbon stack.

10 32. The optical fiber cable as claimed in claim 28, wherein a contact hardness of the cushion member on a side of the cushion member which contacts the optical fiber ribbon stack is a softer than a contact hardness of the cushion member on a side of the cushion member which faces the buffer tube.

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